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A new *Dothidasteroma* species on leaves of *Psidium laruotteanum* from the Brazilian Cerrado

C.A. Inácio, R.C. Pereira-Carvalho, E.S.C. Souza & J.C. Dianese*

Departamento de Fitopatologia, Universidade de Brasília, 70.910-900 Brasília, D.F., Brazil
*Correspondence to: *jcarmine@unb.br*

Abstract— A new *Dothidasteroma* species found on leaves of *Psidium laruotteanum* collected in the Brazilian Cerrado is described, illustrated, and designated as *Dothidasteroma psidii*.

Key words— ascomycetes, foliicolous fungi, *Parmulariaceae*, fungal taxonomy, Neotropical mycodiversity

Introduction

Since 1993 over 100 new fungi from the Brazilian Cerrado have been described (Dianese et al. 1997, Dianese 2000, Inácio & Dianese 1998, 2006), including major finds among the cercosporoid fungi (Inácio & Dianese 1999a, Dornelo-Silva et al. 2007, Hernandez-Gutiérrez & Dianese 2008, 2009), two new genera of rust fungi (Dianese et al. 1993, 1995), three new ascomycete genera (Dianese et al. 2001, Pereira-Carvalho et al. 2009a, 2010), and eleven new genera of trichomatous hyphomycetes (Dornelo-Silva & Dianese 2004, Pereira-Carvalho et al. 2009b).

Foliar ascomycetes are common among the 22,000 specimens deposited in Herbarium UB, Mycological Colletion, and exsiccates of a myrtaceous host, *Psidium laruotteanum* Cambess., revealed a new *Dothidasteroma* species that is now described and illustrated.

Materials & methods

Lesions on host leaves were initially observed under a stereomicroscope; samples were taken for squash preparations and sectioning with a Micron Freezing Microtome, before being mounted as semi-permanent slides. In most cases the samples were stained with lacto-glycerol-cotton blue or glycerol-KOH-phloxine B, and the slides sealed with nail polish, but color observations were done in water preparations. Morphological studies, measurements, and photomicrography were done with a Leica DM 2500 microscope

coupled with a Leica DFC 490 digital camera connected to a microcomputer. Image capture, editing, and measurements were made with Leica QWin V3 software. Ascomata were illustrated also using SEM. The dimensions of all structures were expressed as the range of sizes.

Taxonomy

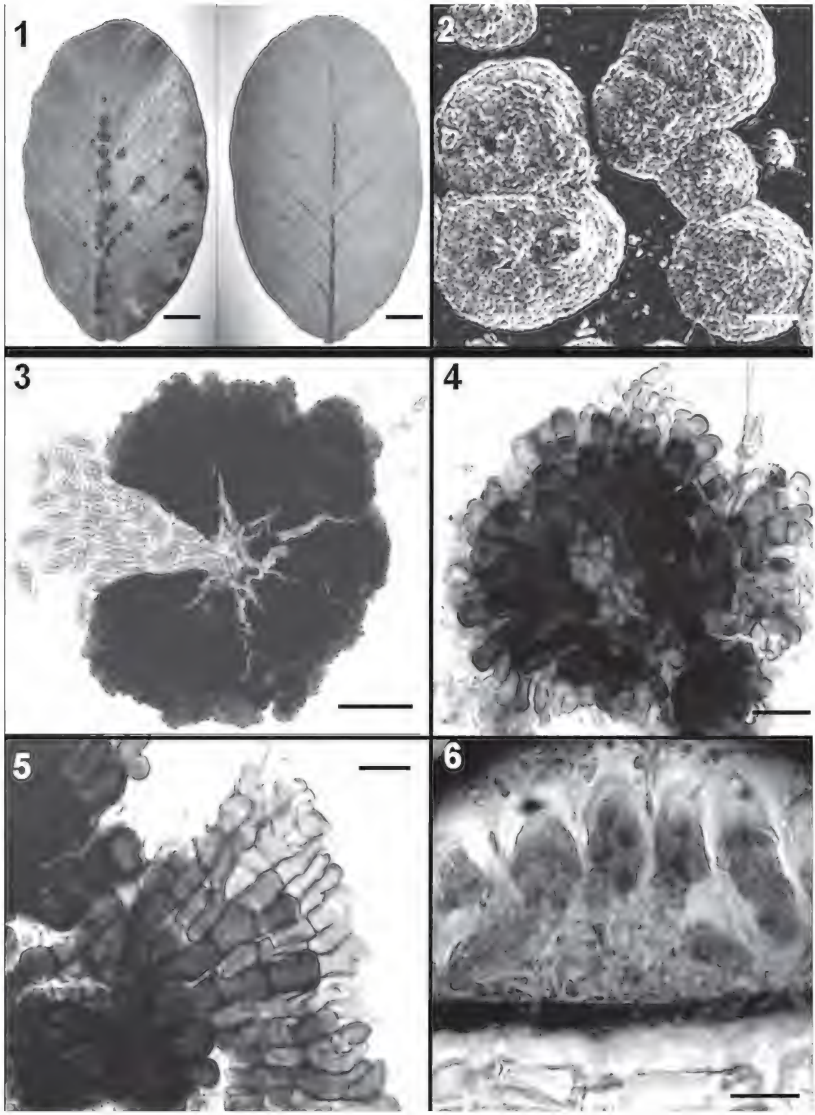
Dothidasteroma psidii Inácio, Pereira-Carvalho, E.S.C. Souza & Dianese, **sp. nov.**

MycoBank MB 518319 Figs 1–11

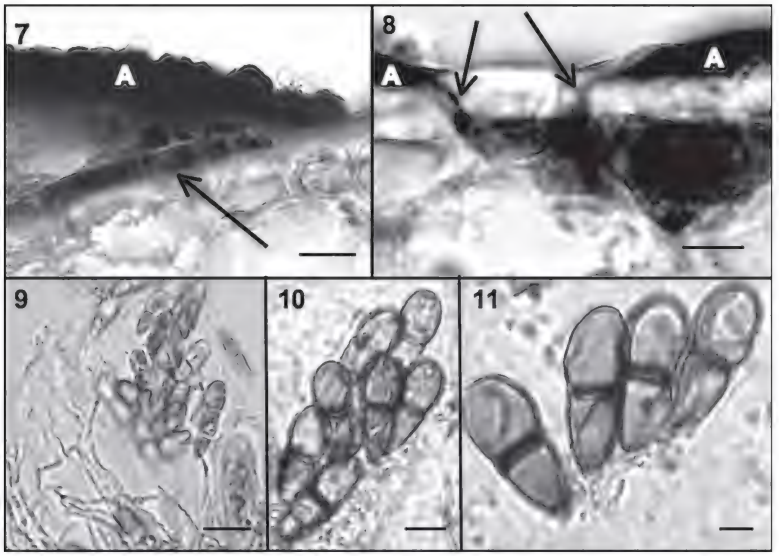
Species haec ab Dothidasteroma casuarinae *ascis longioribus et ascosporis brevioribus.*

Type: Brazil. Distrito Federal, Brasília, Parque Nacional on leaves of *Psidium laruotteanum* Cambess. (*Myrtaceae*), 13 Sept 1995, *leg. M. Sanchez* 1205, **holotype** (UB Mycol. Coll. 9935).

Symptoms scattered or confluent leaf spots, up to 12 mm diam., mostly epiphyllous less frequently hypophyllous, elliptical or circular to irregular, brown to dark brown with pale reddish purple borders; along the midrib colonies appear amphigenous as elliptical or elongate dark lesions, containing an aggregation of black conspicuous discoid stromata with a central opening that splits in a stellar fashion when wet. Mycelium internal, conspicuous, hyaline, filamentous; hyphae 2–4 µm diam. emanating from internal hypostromata towards the cuticle where stromatic erumpent ascomata are formed. Stromata subcuticular, intracuticular to intradermal, sparse to extensive, 5–16 µm deep, mostly one-layered; cells brown to dark brown, 4–16 × 5–11 µm. Ascomata originating from the immersed stromata, scutate, variable in shape, usually ± circular, brown to dark brown, confluent, opening by irregular fissures, measuring 153–790 × 66–194 µm in vertical. upper surface composed of pale to dark brown cells 8–13 × 3.5–10 µm, that proliferate percurrently in a dichotomous fashion resulting in textura prismatico-radiata, with a crenate to laciniate margin; upper wall dense, brown, thick; locules 70–115 × 183–265 µm, single, initially filled by the hamathecium that partially change into a gelatinous mucus as the asci develop. Asci maturing sequentially, with young and mature individuals in the same locule; young asci obovoid, clavate to broadly clavate, becoming thick-walled particularly in the upper part; full-size asci with colourless spores 35–55 × 26–35 µm, clavate to broadly clavate, thick-walled particularly in the upper part, J–, with 8 spores arranged in two rows or in a cluster; full-size asci with brown mature spores 32–65 × 13–25 µm, clavate. Ascospores 15–21 × 6–8 µm, initially colourless, guttulate, becoming light brown to brown, ellipsoidal to cylindric-ellipsoidal, thin-walled, smooth, 1-septate, constricted at the septum, lower cells 6.5–10 × 5–6 µm tapering towards the base; upper cell ± globose, 8–11 × 5–8 µm. Hamathecium of filiform branched paraphyses initially filling the locules, but mostly evanescing as the asci develop, colourless, septate, thin-walled, slightly bulbous at the tip, 1–3 µm diam.



Figs. 1–6. *Dothidasteroma psidii* on *Psidium laruotteanum*. 1. Host leaves showing adaxially (left) well developed circular sometimes coalescent ascomata along the leaf ribs, and linear disposition of small ascomata mostly on top of the midrib on the abaxial (right) surface (bar = 1 cm). 2. A group of ascomata seen in SEM (bar = 300 μm). 3. Squash preparation showing an ascoma releasing the asci under pressure (bar = 100 μm). 4. Upper surface of a circular ascoma showing a radiate texture with irregular border with a clearer central area where ascomata usually split open in a stellar fashion (bar = 30 μm). 5. Detailed view of the radiate texture of an ascoma showing the dichotomous proliferation of the upper wall components resulting in a crenate to laciniate margin (bar = 10 μm). 6. Disposition of the asci within an ascoma (bar = 20 μm).



Figs. 7–11. *Dothidasteroma psidii* on *Psidium laruotteanum*. 7. An ascoma (A) with a layer of intra-cuticular dark hypostroma (arrow) showing hyphal connections with host epidermal cells (bar = 10 μm). 8. Immersed hypostroma growing through the epidermis (arrows) to originate two ascomata (A) (bar = 5 μm). 9. Brown ascospores released among paraphyses (bar = 20 μm). 10–11. Brown mature ascospores (bars = 10 and 5 μm, respectively).

Additional specimens examined: **BRAZIL. Brasília:** Parque Nacional on living leaves of *Psidium laruotteanum* 20 Feb 1999, *leg Z. M. Chaves* 220 (UB Mycol. Coll. 10.256). Parque Nacional on living leaves of *P. laruotteanum*, 15 Feb 1999, *leg. Z. M. Chaves* 212 (UB Mycol. Coll. 10.127). Parque Nacional on living leaves of *P. laruotteanum*, 27 Sept 1995, *leg C. M. Leadebal* 44 (UB Mycol. Coll.10.138). Lago Norte; on leaves of *P. laruotteanum*, 11 Nov 1992, *leg. J. C. Dianese* 629 (UB Mycol. Coll. 2752).

Comment: Höhnel (1909) erected the genus *Dothidasteroma* for fungi with "subcuticular subiculum forming a 1-cell layer, superficial, with rather flat stromata, with locules mostly irregular, opening by fissures; asci 8–spored with 1–septate ascospores." Among the genera of the *Parmulariaceae* close to *Dothidasteroma* is *Aulacostroma,* which shows superficial mycelium with bulbous apressoria, contrasting with *Dothidasteroma,* which lacks superficial hyphae or hyphal strands. A recent new monotypic genus, *Mintera* (type species *M. reticulata* (Starbäck) Inácio & P.F. Cannon) also produces an effuse brown internal stroma connected to the superficial ascomata with small peg-like columns, but differs from *Dothidasteroma* mainly by producing a superficial appressoriate mycelium and ascomata with radiating locules (Inácio & Cannon 2003).

Dothidasteroma species are primarily diagnosed by the presence of subcuticular effuse brown stromata, which give rise to superficial stromatic

ascomata. The immersed stromata remain connected to the mature ascomata by single hyphae, stromatic columns, bundles of hyphae, or peg–like filaments (Inácio & Cannon 2008). In *Asterinaceae* three genera (*Dothidasteromella*, *Macowaniella*, and *Echidnodes*) show immersed stromatic structures similar to those of *Dothidasteroma*, although all three clearly differ in forming a well developed hyphopodiate superficial mycelium (Inácio & Cannon 2008). *Dothidasteroma psidii* has been erroneously reported earlier from Brasilia (Inácio & Dianese 1999b) as a *Polycyclinopsis* species (Pereira-Carvalho et al. 2009c).

Our report constitutes a first record of the genus on a myrtaceous host and also represents the first *Dothidasteroma* species from South America (previously known only from Australia, Philippines, and Sri Lanka; Inácio & Cannon 2008, Müller & Arx 1962, Swart 1988, Sydow & Sydow 1917).

As recently revised by Inácio & Cannon (2008), *Dothidasteroma* contains three species—the type *D. maculosum* (Berk. & Broome) Höhn. on *Pterygota alata* (*Sterculiaceae*), *D. casuarinae* H.J. Swart on *Casuarina luehmannii (Casuarinaceae),* and *D. dipteridis* (Syd. & P. Syd.) Arx on *Dipteris conjugata* (*Dipteridaceae*). The new species differs from all three, and can be segregated from them, as follows:

1a. Ascospores verrucose 2
1b. Ascospores smooth 3

2a. Asci 35–55 × 26–35 µm, spores 18–26 × 8–10 µm, on *Dipteris* . . . . . ***D. dipteridis***
2b. Asci 55–76 × 25–45 µm, spores 19–40 × 11–19 µm, on *Pterygota* . . . ***D. maculosum***

3a. Ascomata connecting to the host by hyphal bundles, asci 30 µm long, ovoid; ascospores light brown, upper cells 15–19 × 10–15 µm, lower cells 9–12 × 8–10 µm, on *Casuarina* . . . . . ***D. casuarinae***
3a. Ascomata connecting to the host by separated hyphal strands, asci 32–65 × 13–25 µm, obclavate to elliptical; ascospores 15–21 × 5-8 µm brown, upper cells 8–11 × 5–8 µm, lower cell ± globose, 6.5–10 × 5–6 µm . . . . . ***D. psidii***

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